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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,472	10/09/2003	Maged E. Beshai	120-320	9171

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EXAMINER	
O CONNOR, BRIAN T	

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2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/682,472	BESHAI ET AL.	
	Examiner	**Art Unit**	
	Brian T. O'Connor	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) *24,25 and 30-32* is/are withdrawn from consideration.

5)☒ Claim(s) *20-23* is/are allowed.

6)☒ Claim(s) *1-5,8,26-29,33-35 and 38-40* is/are rejected.

7)☒ Claim(s) *6,7,9-19,36,37,41 and 42* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 24, 25, and 30-32, drawn to a method of path establishment for an optical network, classified in class 370, subclass 360.

   II. Claims 1-23, 26-29, and 33-42, drawn to an optical network, switching nodes, and mesh networks with core and edge nodes, classified in class 370, subclass 406.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because setting a path as in Group I does not require that the network be a meshed network with subtending rings. The subcombination has separate utility such as Group II can be employed to shared low-speed and high-speed optical data paths.

The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

A telephone call was placed to Lindsay McGuinness on August 7, 2007 to request an oral election to the above restriction requirement and resulted in the election of claims grouped in Invention II with traverse. Thus, claims 24, 25, and 30-32 are withdrawn from consideration in the instant application.

Drawings

3. Figures 10 and 16 are objected to because the brief description states they are embodiments of the invention (pg 7-8 of Specification) but both figures have the label "PRIOR ART". Figures 1, 11, and 18 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 33-35, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Livermore et al. ("Architecture and Control of an Adaptive High-Capacity Flat Network", IEEE Communications Magazine, May 1998; hereafter Livermore) in view of Blanc et al. (US 6,343,081; hereafter Blanc).

With respect to claim 1, Livermore discloses a network with a group of optical core nodes in a central domain (Figure 13) and every node has a group of input ports and output ports to connect with other core nodes (Figure 15). The network includes edge nodes in side domains (Figure 13) arranged in a subtending manner (second full paragraph, right column, pg 111). An output port on a core node is shown connecting to an input port of another core node (Figure 14). Livermore also discloses an optical switch fabric for each core node (wavelength switch in Figure 14; wavelength switch in Figure 15).

Livermore fails to disclose a signal buffer and buffer controller for a channel between two core nodes.

Blanc discloses an access device (1000 of Figure 7) for a core node with a signal buffer (701, 702, 703, 704 of Figure 8) and a buffer controller (710 of Figure 8) for each signal going to a core node (541, 542, 543, 544 of Figure 7).

Blanc teaches the benefit of optional enhancement for multicast abilities of an optical switch fabric by using buffers and a controller (column 19, lines 44-53). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the buffering elements of Blanc with the network of Livermore.

With respect to claim 33, Livermore discloses a meshed network with a group of optical core nodes in a central domain (Figure 13) and every node has a group of input ports and output ports to connect with other core nodes (Figure 15). An output port on a core node is shown connecting to an input port of another core node (Figure 14). Livermore also discloses an optical switch fabric for each core node (wavelength switch in Figure 14; wavelength switch in Figure 15).

Livermore fails to disclose a buffer an input port.

Blanc discloses an access device (1000 of Figure 7) for a core node with a signal buffer (701, 702, 703, 704 of Figure 8) for each signal going to the core node (541, 542, 543, 544 of Figure 7).

Blanc teaches the benefit of optional enhancement for multicast abilities of an optical switch fabric by using buffers and a controller (column 19, lines 44-53). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the buffering elements of Blanc with the network of Livermore.

With respect to claim 34, Livermore further discloses a group of edge nodes in side domains (Figure 13) arranged in a subtending manner (second full paragraph, right column, pg 111). Livermore also discloses edge devices (section: "Internet Services", left column, first full paragraph, pg 112; viewed as data sources and data sinks) for conducting voice communications (right column, first full paragraph, pg 106).

With respect to claim 35, Livermore further discloses an optical add/drop (Figure 14) to interface the subtending edge node with the core node, the same optical add/drop interfaces to input and output ports on the core node.

With respect to claim 38, Livermore discloses a meshed network with a group of optical core nodes in a central domain (Figure 13) and every node has a group of input ports and output ports to connect with other core nodes (Figure 15). An output port on a core node is shown connecting to an input port of another core node (Figure 14). Livermore also discloses an optical switch fabric for each core node (wavelength switch in Figure 14; wavelength switch in Figure 15).

Livermore fails to disclose a buffer an input port.

Blanc discloses an exit device (5000 of Figure 7) for a core node with a signal buffer (801, 802, 803, 804 of Figure 9) for each out-going signal from the core node (641, 642, 643, 644 of Figure 7).

Blanc teaches the benefit of optional enhancement for multicast abilities of an optical switch fabric by using buffers and a controller (column 19, lines 44-53). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the buffering elements of Blanc with the network of Livermore.

With respect to claim 39, Livermore further discloses a group of edge nodes in side domains (Figure 13) arranged in a subtending manner (second full paragraph, right column, pg 111). Livermore also discloses edge devices (section: “Internet Services”, left column, first full paragraph, pg 112; viewed as data sources and data sinks) for conducting voice communications (right column, first full paragraph, pg 106).

With respect to claim 40, Livermore further discloses an optical add/drop (Figure 14) to interface the subtending edge node with the core node, the same optical add/drop interfaces to input and output ports on the core node.

6. Claims 2-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Livermore in view of Blanc and further in view of Oki et al. (US 7,046,661; hereafter Oki).

With respect to claim 2, Livermore further discloses an optical add/drop (Figure 14) to interface the subtending edge node with the core node, the same optical add/drop interfaces to input and output ports on the core node.

Livermore fails to disclose that the ports are bufferless.

Oki discloses, in an invention of a multi-stage switch, modules in the switch (140 of Figure 1) that are buffer-less (column 7, lines 17-21).

Oki teaches the benefit of reduced out-of-sequence problems by employing bufferless (column 7, lines 22-24). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the buffer-less property as taught by Oki with the network of Livermore.

With respect to claim 3, Livermore fails to disclose a buffer on an input port.

Blanc discloses buffers (541, 542, 543, 544 of Figure 7) for each signal going to a core node.

Blanc teaches the benefit of optional enhancement for multicast abilities of an optical switch fabric by using buffers and a controller (column 19, lines 44-53). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the buffering elements of Blanc with the network of Livermore.

With respect to claim 5, Livermore fails to disclose a buffer on an output port.

Blanc discloses buffers (641, 642, 643, 644 of Figure 7) for each out-going signal from a core node.

Blanc teaches the benefit of optional enhancement for multicast abilities of an optical switch fabric by using buffers and a controller (column 19, lines 44-53). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the buffering elements of Blanc with the network of Livermore.

With respect to claim 8, a buffer added to the network Livermore must have an optical-to-electrical converter and an electrical-to-optical converter due to edge networks being electrical and the core nodes being optical (electronic switching, optical add/drop of Figure 14).

Livermore fails to disclose a buffer.

Blanc discloses buffers (641, 642, 643, 644 of Figure 7) that contain electronic memory (FIFOs of Figure 8, FIFOs of Figure 9).

Blanc teaches the benefit of optional enhancement for multicast abilities of an optical switch fabric by using buffers and a controller (column 19, lines 44-53). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the buffering elements of Blanc with the network of Livermore.

7. Claims 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Livermore in view of Kim (US 6,044,091).

With respect to claim 26, Livermore discloses a network with a group of optical core nodes in a central domain (Figure 13) and every node has a group of input ports and output ports to connect with other core nodes (Figure 15). Livermore also discloses an optical switch fabric for each core node (wavelength switch in Figure 14; wavelength switch in Figure 15) with a number of ports. In order for the ports to function correctly each port must have an optical-to-electrical converter and an electrical-to-optical converter due to edge networks being electrical and the core nodes being optical (electronic switching, optical add/drop of Figure 14). The ports must also have a data memory in order to receive and send frames and subframes (Figure 8) through the network.

Livermore fails to disclose a controller adapted to time-lock a group of source nodes so that a signal send by each source node arrives at the controller at a time determined by the controller.

Kim discloses a controller (210, 100 of Figure 3) for measuring the transmission delay between a single bode (E of Figure 2) and a group of source node (D, C, A of Figure 2) then synchronizing counters (220, 120 of Figure 3) to coordinate transmission among the nodes (step b, step c, step d of claim 1).

Kim realizes the benefit of improved guaranteed levels of service by time synchronizing nodes along a signal path (column 3, lines 5-12). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the technique of Kim with the network of Livermore.

With respect to claim 27, Livermore further discloses ports on the switch to send signal to external source and sink nodes (port between wavelength switch and optical add/drop of Figure 14) and ports on the switch to send and receive signals to other optical nodes (port between first wavelength switch and second wavelength switch of Figure 14).

With respect to claim 28, Livermore fails to disclose a controller to time-locking nodes, however one possessing ordinary skill in the art would realize that by adding a controller to Livermore that the switch must have a port to communicate with the controller.

Kim discloses a controller (210, 100 of Figure 3) for measuring the transmission delay between a single bode (E of Figure 2) and a group of source node (D, C, A of Figure 2) then synchronizing counters (220, 120 of Figure 3) to coordinate transmission among the nodes (step b, step c, step d of claim 1).

Kim realizes the benefit of improved guaranteed levels of service by time synchronizing nodes along a signal path (column 3, lines 5-12). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the technique of Kim with the network of Livermore.

With respect to claim 29, Livermore fails to time-locking with any nodes.

Kim discloses a controller (210, 100 of Figure 3) for measuring the transmission delay between a single bode (E of Figure 2) and a group of source node (D, C, A of

Figure 2) then synchronizing counters (220, 120 of Figure 3) to coordinate transmission among the nodes (step b, step c, step d of claim 1).

Kim realizes the benefit of improved guaranteed levels of service by time synchronizing nodes along a signal path (column 3, lines 5-12). Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to use the technique of Kim with the network of Livermore.

Allowable Subject Matter

8. Claims 20-23 are allowed.

9. Claims 6, 7, 9-19, 36, 37, 41, and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

1. The following is an examiner's statement of reasons for allowance:

The prior art fails to teach or fairly suggest a network with a group of edge nodes and a group of core nodes (at least one containing an optical switch fabric and a core controller) arranged so that at least one edge node is time-locked to at least on core node. In addition, the core controller will receive request for transfer of finite time signals from an edge node, compute a transfer schedule for the signals, and allocate a continuous path from at least one core node to move the signals to at least on edge node that subtends another core node as claimed in independent claim 20.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. O'Connor whose telephone number is 571-270-1081. The examiner can normally be reached on 9:00AM-6:30PM, M-F, 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Brian T. O'Connor
August 10, 2007

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